REVISION OF THE GHOST MOTHS (LEPIDOPTERA HOMONEURA, FAMILY HEPIALIDAE)

PART VII

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Plates xvi-xxiii and text fig. 1-35

INTRODUCTION

Part VI of this revision was published in these Records, vol. XI, no. 4, 1955, pp. 307-344. The various genera of the family Hepialidae are being revised as opportunities offer; it is intended when the series is complete to discuss their mutual relationships.

Genus **Endoclita**

In Part IV of this Revision (Tindale 1941, v. VII, pp. 18-39) the Indian members of this genus were discussed. To these are now added those species whose ranges extend to Indonesia, South-East Asia and the islands off the coast of East Asia as far north as Japan. Twenty-nine species are discussed, of which fifteen are described and figured as new.

It may be of interest to note that few members of the genus *Endoclita* seem to live east of Wallace's Line, where the genus *Oenetus* tends to replace it. *E. sibelae* Roepke 1935, the only reported species, which may be an exception, is from Batjan. It has not been examined. In general the species are relict ones and those of adjoining areas, though clearly related, have, from long isolation, become genetically so far sundered as to represent distinct species. Even forms seemingly very close in general appearance may be separated readily on examination of genital structures and wing venation, etc.

Little is known about their life histories. Of most of the species only a relatively few examples ever have been taken, and most of these have been captured only as a result of casual encounter, rather than after systematic search for them. Even the bringing together, on loan, of much of the available new material has yielded only meagre series upon which to base the study.

The status of the genus *Endoclita* has been discussed earlier and there is little to add. In some of the East Asian species the curious local expansion of the costa of fore-wing in the region of Sc_1 is at a maximum; elsewhere it has been suggested that this character cannot be used with any satisfaction to give separation of those possessing it, with full generic rank. The valid name *Hypophassus* is available for use by anyone who may see fit to employ it as a subgeneric tag.

Study of East Asian species suggests that some small variations occur in the positions of the cross veins. Thus in the fore-wings of *E. hosei* im vein appears just beyond the fork of M_1 and M_2, instead of before it as in the genotype, while similar variations occur also in the hindwings of this and other species. There is also variation in the number of vannal veins in the hindwing, especially in females. In this sex there is a tendency for the development of two strong veins after Cu_2 with occasional traces of a short third one near base of wing. These veins are probably respectively PCu, 1V and 2V. In other species only one such vein extends to the margin of the wing. In such species it seems generally to be that PCu is lost or developed only near the base of the wing and 1V is the strong vein extending to the margin while 2V may be reduced to a short stub near the base.

There is also some variation in the dimensions of the posterior legs, which in general tend to be reduced in size and to possess a specialized plume of hairs on the tibiae. In some species these hairs are found to be concealed in a fold of the integument of the thorax, in others the plume is large and in all available specimens is found fully displayed. Because of the poor condition of most of the specimens which are taken it is not always clear whether the difference between concealed and displayed male plumes is a real phenomenon or whether it is due merely to accidents of preservation. However the varying degree of reduction in the size of the posterior leg is of significance.

The genus is notable, in some species, for the enlarged eyes of the male and occasionally of the female. In this character they resemble members of the Australian and New Guinea genus *Oenetus* in which there also occurs every degree of enlargement of the male eyes. In that genus however it seems to reach a maximum.

The tendency to have enlarged eyes is not the only link between these two genera and it may be correct to say that *Oenetus* and *Endoclita* may be rather closely related with a tendency to replace each other east and west of Weber's or of Wallace's Line. Both genera

belong to that section of the family in which the larvae have a timber-boring habit and live principally in relatively wet, forested country, with a high, and year round rainfall. In general they are very vulnerable to periods of aridity. Some species extend to the temperate zone, as in Northern Japan and Tibet, but their true home seems to be in the wet tropics where their habitats appear to range from sea level near mountain ranges to altitudes of at least 6,500ft.

In the females of some species the anterior gonapophyses of the genitalia appear to be in some measure different on the two sides of the body. The condition is not unique in the family, for in some South American species the genitalia are so completely asymmetrical that it is hard to reconcile the two sides.

In this genus earlier authors were often confused by the similarities of wing marking in the species. They tended to pick out examples possessing the same general wing patterns, as species and later workers have tended to accept these wing pattern assemblages as species. Only through the study of characters of the genitalia has it been found that the several forms often found standing together in collections under one name label can be sorted out as discrete species. There sometimes has been uncertainty surrounding the identification of the one which should be linked with the original name and description, hence in the preparations for the present Revision most of the type specimens of the earlier described species have had to be sought out and re-examined. Only in the case of *E. annae* perhaps does some doubt remain as to the species intended to be described.

The Indian species of the genus were keyed in the earlier part of this revision. The following key, based almost entirely on the genitalia, gives only the East Asian forms dealt with in this paper. It is of necessity incomplete because the opposite sexes of some species are still unkown.

KEY TO THE EAST ASIAN AND INDONESIAN SPECIES OF ENDOCLITA (based principally on the genitalia)

MALES

1. Tegumen of genitalia with a posterior, ventrally directed spine . . . . . *marginenotatus*
   Tegumen of genitalia without a posterior, ventrally directed spine 2

2.	Tegumen in lateral view with ventral margin unarmed	3
	Tegumen in lateral view with ventral margin armed	12
3.	Margins of tegumen not widely apart at posterior extremity	4
	Margins of tegumen widely apart at posterior extremity	5
4.	Tegumen with more than two longitudinal keels	*paraja*
	Tegumen with only two longitudinal keels	*javaensis*
5.	Posterior margin of 8th sternite with distinctly angulate median notch	6
	Posterior margin of 8th sternite without distinctly angulate median notch	7
6.	Posterior margins of tegumen not touching posteriorly	*excrescens*
	Posterior margins of tegumen touching posteriorly	*sinensis*
7.	Teguminal margin curved	8
	Teguminal margin straight	11
8.	Teguminal margin forming an S curve	*camphorae*
	Teguminal margin not forming an S curve	9
9.	Sternite 8 strongly transverse	10
	Sternite 8 nearly as long as wide	*aikasama*
10.	Ventral lips of tegumen slenderly chitinized	*sericeus*
	Ventral lips of tegumen stoutly chitinized	*aurifer*
11.	Margins of tegumina parallel in posterior half (anterior half concealed)	*broma*
	Margins of tegumina diverging from anterior to posterior extremity (anterior half not concealed)	*salvazi*
12.	Spines on tegumen serially arranged	14
	Spines on tegumen not serially arranged	13
13.	Spines on tegumen in a double group	*aroura*
	Spines on tegumen in a single group	*raapi*
14.	Serial spines confined to anterior half of tegumen	*tosa*
	Serial spines along most of margin	15

15. Posterior half of tegumen strongly dilated .. *aurata*
Posterior half of tegumen not dilated 16

16. Eighth sternite with hind margin not notched 17
Eighth sternite with hind margin notched .. .. *crenilimbata*

17. Tegumen in lateral view with anterior spine .. *niger*
Tegumen in lateral view without anterior spine *davidi*

Males either unknown or not keyed:—
annae, sibelae, dirschi, niphonica, williamsi, warawita, taranu, kosemponis, ijereja, hosei, kara.

FEMALES

1. Posterior margin of 7th sternite convex 2
Posterior margin of 7th sternite in some measure concave 4

2. Eighth sternite longer than wide .. .. *aroura*
Eighth sternite as wide as or wider than long 3

3. Anterior gonapophyses broad and not pointed *sericius*
Anterior gonapophyses narrow and pointed .. *aurata*

4. Seventh sternite more than one half as long as wide 5
Seventh sternite less than one half as long as wide 9

5. Ventral portion of 8th sternite not wide at anterior margin 6
Ventral portion of 8th sternite wide at anterior margin 7

6. Eighth sternite with posterior half dilated .. *topeza*
Eighth sternite with posterior half not dilated *davidi*

7. Anterior gonapophysial plate with spine at postero-median angle .. .. *kosemponis*
Anterior gonapophysial plate without spine at postero-median angle 8

8. Anterior gonapophyses as large flat plates .. *camphorae*
Anterior gonapophyses as small irregular plates *excrescens*

9. Posterior gonapophyses dilated at posterior extremity 10
Posterior gonapophyses not dilated at posterior extremity 13

10.	Ventral eminence of 8th sternite much longer than wide	*warawita*
	Ventral eminence of 8th sternite about as wide as long	11
11.	Posterior gonapophyses attenuated posteriorly	*williamsi*
	Posterior gonapophyses broadened posteriorly	12
12.	Sides of 7th sternite parallel	*taranu*
	Sides of 7th sternite converging towards anterior margin	*hosei*
13.	Anterior gonapophyses longer than wide	*kara*
	Anterior gonapophyses wider than long	*ijereja*

Females either unknown or not keyed:—

marginenotatus, paraja, javaensis, sinensis, aikasama, aurifer, broma, salvazi, raapi, tosa, niger, crenilimbata, annae, sibelae, dirschi, niphonica.

Endoclita marginenotatus (Leech)

This species was referred to and figured in the earlier part of my revision (1941, p. 22 and fig. 15); there is nothing fresh to add; it is keyed herein so that all the known Chinese species are mentioned.

Endoclita paraja sp. nov.

Plate xvi, fig. 1 and text fig. 1

Male: Antennae threadlike, short; head with eyes only moderately large, head, thorax, abdomen, except base, fuscous brown, legs and base of abdomen paler; posterior legs of moderate size, with large tibial plume of orange-yellow hairs. Forewing straight to Sc_1, then strongly excavate before tip, apex falcate, termen and inner margin somewhat sinuate; im vein touching M forks at both ends, wing colour chocolate-brown with paler, somewhat irridescent transverse bands in anal and terminal areas and a triangular patch at about one-half length of cell; a cluster of three small black-rimmed silvery-white spots around junction of rm vein with M_1 and another set of three at basal M fork, two other tiny spots half way between rm vein and termen; a notable dark patch at point of obsoleseence of Cu_2, also traces of dark marks along costa. Hindwings with costal margin slightly concave, apex subfalcate, termen angled, im vein as in forewing; vannal region with PCu obsolete except at base, 1V and 2V both present, the latter a short

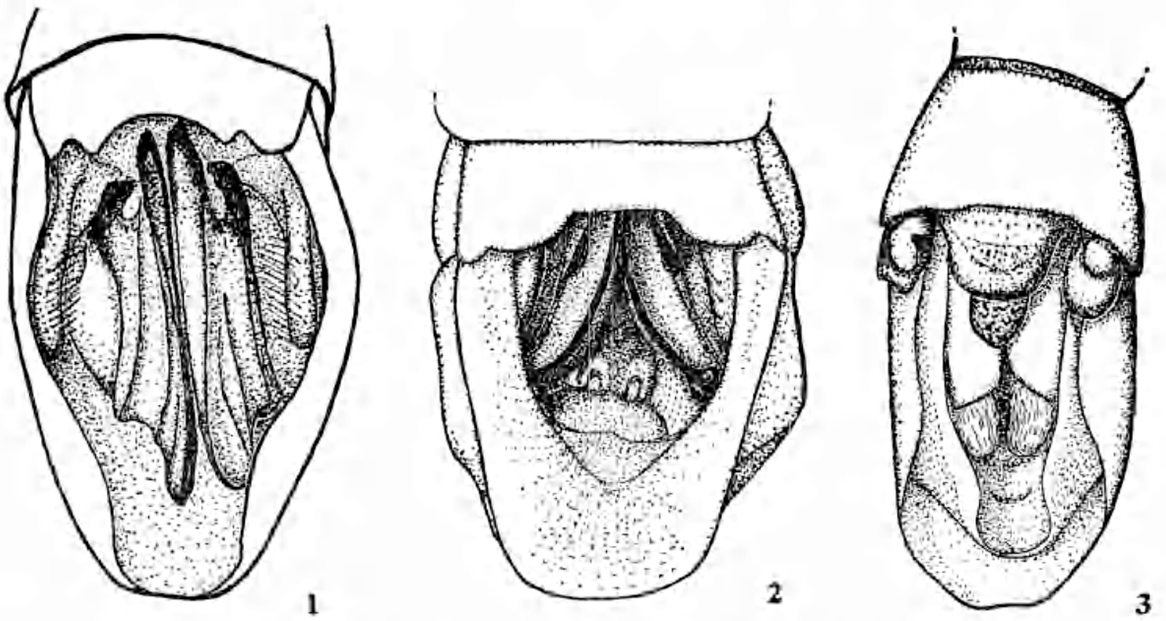


Fig. 1-3. 1. *Endoclita paraja* Tindale, Borneo (?), male genitalia, ventral aspect. 2. *Endoclita excrescens* (Butler), Japan (Loomis), male genitalia, ventral aspect. 3. Female, Mt. Takao, genitalia, ventral aspect.

vein; tip of wing coloured as in forewing, with a single black-rimmed silvery spot just below R_5 near tip; rest of wing an iridescent purplish-blue in many angles of light, gray in others; the termen somewhat less iridescent, vannal region and base clothed in grayish-brown hairs. Wings beneath with traces of dark-brown spots along costa, otherwise dull iridescent purple, or grayish-brown, depending upon angle of view. Wing length 40 mm., expanse 85 mm.

Loc. Unknown (?Borneo) a male in Tring Collection at British Museum.

The only known example was found among Tring Museum duplicates with deficient locality data, but is believed to have come from Borneo.

The male genitalia (fig. 1) have the 8th sternite transverse with a median large notch and two smaller side notches on the posterior margin. The tegumen is large, in lateral view it shows rather an evenly curved silhouette with smooth margin; in ventral view the two teguminal plates are carried close together in the midline and show side ridges, one of which terminates anteriorly in a strong process; the harpes, so far as they may be seen, are simple, with a brush of forwardly directed hairs.

In the form of the genitalia this species bears some distant relationship to *E. javaensis* but that species has a far more delicately formed tegumen, without lateral keels and strong antero-lateral processes.

The species is characterized by the presence of the most brilliant purplish-blue, almost violet flush yet seen on the hindwings of any member of the genus. A similar example in the British Museum, which I have not been able to study in detail, may belong to the same species. It is labelled as from Borneo, and this may well confirm the place of origin of the specimen described above. It is similar to *E. tosa* of Java in its wing patterns but the genitalia show a double ridged tegumen instead of the simple one of that species; the hind margin of the 8th sternite shows three notches instead of one.

Endoclita javaensis Viette

Endoclita javaensis Viette 1950, Bull. Inst. roy. des Sc. nat. de Belgique, 26 (41) p. 1; fig. 1 (genitalia).

Loc. East Java: Nongkodjadjar, Tengger, 1 Dec. 1933 4,000ft. (type, a male, unique, expanse 77 mm., in coll. Institute royal des Sciences naturelles de Belgique, I.G. 10.706).

This species has not been examined.

There is stated to be a costal swelling on the forewing; and the male genitalia, as figured, have the tegumen furnished with two anteriorly directed blunt processes and a ventral keel which presents a simple outline. So far as may be judged by the description and figure this species is nearest to *E. paraja,* which differs in having large antero-lateral processes on the tegumen and a very robust ventral keel.

Endoclita excrescens (Butler)

Plate xvi, fig. 2 and text fig. 2-3

Hepialus excrescens Butler 1877, Ann. Mag. Nat. Hist. xx, p. 482 (female, not a male); Butler 1878, Ill. Lep. Het. B.M. ii, p. 20, pl. 27, f. 7.

Phassus aemulus Butler 1877, Ann. Mag. Nat. Hist. xx, p. 482 (male); Butler 1878, Ill. Lep. Het. B.M. ii, p. 20, pl. 27, f. 8.

Hepialus excrescens Leech, 1888, Proc. Zool. Soc. Lond., p. 645.

Hepialus excrescens Staudinger, 1892, Romanoff, Mem. Lep. (8), p. 289.

Phassus herzi Pfitzner, 1912, Seitz Macrolep. ii, p. 438, pl. 54a (*nec.* Fixsen).

Phassus excrescens Pfitzner and Gaede 1933, Seitz Macrolep. x, p. 842.

Male. Antennae thread-like, tapering, of about 22 segments, pale-brown; eyes normal; head rough-haired; head, thorax and abdomen above pale brown, bases of antennae, sides of thorax, and legs a richer orange-brown; posterior legs not reduced; a large tibial tuft of bright orange hairs present. Forewings with costal margin rather straight, a scarcely noticeable elevation in region of Sc_1; termen and inner margin forming a single even curve; im vein touching forks at both ends; wing colour warm brown with pale grayish-fawn marking and bands, many outlined narrowly in black. Hindwings with costa sinuate and narrowly bordered with colour and markings of forewing; rest of wing dull gray with only slight traces of a bronzy lustre when viewed from special angles; inner area with only Cu_2 and one vannal vein present, as in the genotype. Wing length 34 mm., expanse 74 mm.

Female. Similar to male in colour and markings. Posterior legs slightly reduced in size but without specialized plumes on tibiae. Forewings with im vein shortly before fork of M_1 and M_2. Hindwing with Cu_2, Pcu, 1V and 2V veins all well developed and extending to margin. Wing length 42 mm., expanse 90 mm.

Loc. Japan: Yokohama (type, a female, collected by Jones, expanse 69mm., and a male, same details, expanse 76mm., described as type of *aemulus*, in British Museum). Yokohama, 25 Sept., 5 Oct. and 9 Oct. 1910; and Oiwake (Berlin Museum); Sugita, 11 Oct. 1889 and Kagoshima, Nov. 1898 (Tring Collection at British Museum), Ussuitoge near Mt. Asama, 2 Aug. 1916; Karuizawa, July 1914 (W. J. Holland) and Mitsukuri (United States National Museum) Tobetsu, Hokkaido, Sept.-Oct. 1903 (A. E. Wileman); Kyushu (J. H. Leech Collection in British Museum) Mt. Takao, 25 Sept. 1926 (Cornell University Collection) Ussuri; Chibaroosk, 2 Aug. 1911, a female (Tring Collection at British Museum).

The male example particularly described and figured in this paper is from Japan, probably Yokohama, and is from the Dr. H. Loomis Collection. It has been compared and agrees very exactly in size, colour and markings with type of *aemulus*, which is the opposite sex of the type of *E. excrescens*, which was wrongly considered also to be a male, but is a rather impoverished female. In the Berlin Museum there are two similar males, from Yokohama, presumably also taken by Dr. Loomis, although they are variously ascribed to "Laomis" and "Laom". The present author recalls with appreciation the encouragement he received from Dr. Loomis in his boyhood collecting efforts in Japan in 1914-1915.

A female from Mt. Takao is described, it also has been compared with the types, and differs from the type female only in its more normal size.

The male genitalia, as drawn without dissection (fig. 2) show the 8th sternite notched in subrectangular fashion along its posterior margin, in lateral view the tegumen is well chitinized with an evenly arcuate silhouette, not armed with spines, in ventral view the tegumina are seen to widely diverge towards the posterior extremity.

Despite marked differences in wing pattern and shape the male genitalia suggest a relationship with *E. crenilimbata*. This relationship is probably real, and may tend to support a view that the degree of expansion of the costa of forewing at Sc_1 is not a good character for generic separations in this genus.

The female genitalia of the Mt. Takao specimen (fig. 3) have the 7th sternite more than half as long as wide and the posterior margin somewhat concave. The 8th sternite has a rather wide and rounded ventral median prominence about as long as wide, its posterior margin is smooth and polished; above it and extending more posteriorly is a rather regose projection about half as wide. The anterior gonapophyses are rugose, that on right side much wrinkled and with a pit, that on left side more rounded in outline. The posterior gonapophyses are wide and are embraced within a roll of the integument of the sternite, which forms a hood, open below, over the ovipore.

The resemblances of the female genitalia are with those of *E. camphorae*, but they are abundantly distinct in the dimensions of the anterior gonapophyses which are small irregular plates in this species, rather asymmetrical on the two sides, whereas in *E. camphorae* they are large smooth plate-like members.

Endoclita sinensis (Moore)

Plate xvi, fig. 3-4 and text fig. 4

Phassus sinensis Moore, 1877, Ann. Mag. Nat. Hist. (4) xx, p. 94.
Phassus herzi Fixsen, 1887, Romanoff, Mem. Lepid, iii, p. 335, pl. 15, fig. 3.

Male. Antennae short, filamentous, ochreous brown. Head, thorax and abdomen grayish-fawn, legs darker; posterior legs somewhat reduced, with a large tibial tuft of ochreous-yellow hairs. Forewing with costa slightly sinuate, no costal dilation at Sc_1, apex rounded, termen and inner margin rounded; wing colour grayish-fawn with a

smoky-brown patch near the base of the cell enclosing a white spot; there is a second elongate white spot, rimmed with black, lying in cell and at one end cut across by the junction of rm vein and M_1; three obscurely paired sets of black spots on costa, these have pale fawn borders; traces of one, occasionally two small, black-margined white spots in a localized brown patch just below apex. Hindwings dull grayish-fawn; vannal region with Pcu reduced to a vestige near base of wing; 2V present as a short vein. Wing length 35 mm., expanse 76 mm.

Female similar to male; wings broader and more rounded, posterior legs without specialized hairs, costal spots of forewing tending to be in sets of three; subapical white spots present. Wing length 36 mm., expanse 79 mm.

Loc. China: Shanghai (type, a female, described as a male, expanse 60 mm., Moore Collection, 94-106 in British Museum); Chekiang (80-123 in British Museum, males, one described above, also a female same details, expanse 97 mm., described by Moore); Kiukiang, June 1887, A. E. Pratt, Tring Collection, in British Museum).

Korea: Gensan June 1887, J. H. Leech (female described above, in Leech Collection at British Museum, 1900-64). Pung Tang, 18 miles N.E. of Seoul, 29 June (the type of herzi, a female, expense 80 mm., in British Museum).

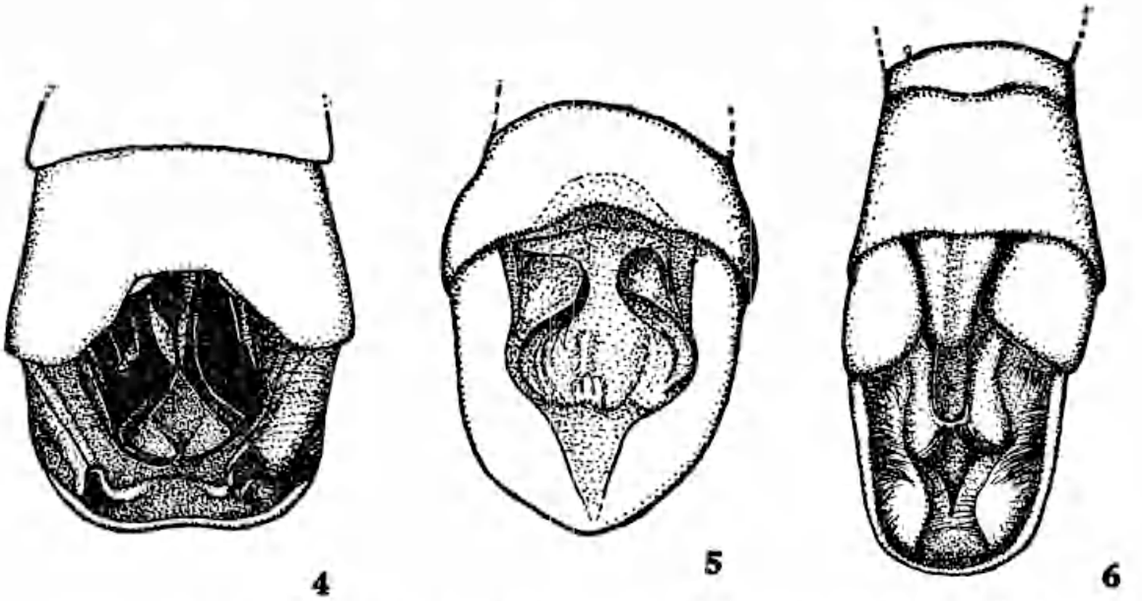


Fig. 4-6. 4. *Endoclita sinensis* (Moore), Kiukiang, male genitalia, ventral aspect. 5. *Endoclita camphorae* (Sasake), Tesio, male genitalia, ventral aspect. 6. Female, Yokohama, genitalia, ventral aspect.

The male of this species has not been previously described, since the type from Shanghai, although described as a male, is a female. I am indebted to Mr. W. H. T. Tams for sending for study, at very short notice, the pair figured here. A rather dilapidated male example from Kiukiang is in the Tring Collection; it has vein M_2 of forewing ending abruptly at about one-third the distance between the fork of M_1 and M_2 and margin. This is probably an individual variant.

It is difficult, on wing markings alone, to separate *E. sinensis* from *E. camphorae* of Japan; in both the sexes are similar and the colour and markings generally indistinguishable. Only when the genitalia are compared do valid differences appear. In the male at least these are quite of specific value, hence it is to be assumed that *E. sinensis* on the Asiatic mainland and *E. camphorae* in Japan are either old races or members of a superspecies which have remained so long apart, genetically, that they must be given the status of separate species. *E. kosemponis* also is clearly related, but is more distinctly separated by wing markings and colour differences as well as by characters of the genitalia. All three may be considered to form a species group in the sense of Zeuner (1943).

The male genitalia in this species (fig. 4) have the 8th sternite very robustly formed, with a broad and deep hind marginal notch and rather square cut outer angles. The tegumen is strongly chitinized and black, with the two side pieces rolled over towards the middle as if forming a longitudinal cylinder with a medium ventral slit; the figure shows (rather inadequately) the general appearance. When viewed from the side that portion of the tegumen which most nearly meets the opposite side in the mid-line is seen to be smooth-margined and to form a rounded eminence. The female genitalia have not been examined.

In addition to the material studied in detail at Adelaide and at the British Museum, examples from the following localities have been seen and most probably belong to the species:—

Korea: Gensan (June and July). China: Ichang (June, Kuikiang (June) and Hongkong.

The type of *Phassus herzi* was briefly examined in the British Museum. It seems unquestionably to be a direct synonym of *E. sinensis*. The figure in Seitz Macrolepidoptera, ii, 1912, plate 54a, supposedly of this species, belongs to *E. excrescens*.

The expanse of the wings of the described "male" type example, was given by Moore as $2\frac{1}{8}$ inches (*i.e.*, 54 mm.) and of his female as $3\frac{1}{2}$ inches (89 mm.). It is difficult to reconcile these dimensions with

ones made by myself on the British Museum specimens, which gave a measure of 60 mm. and 78 mm. respectively ($2\frac{3}{8}$ and $3\frac{1}{8}$ inches). It should also be noticed that Moore speaks of the light coloured markings on the forewings of his species as bright yellow, whereas those of the examples seen seem to be silvery-white. It is not clear whether the present day appearance is due to the post-mortem changes of the past 70 odd years since they were captured, variation in several examples, differences in the quality of the light in which they were examined for the purposes of the original description, or a combination of all these.

Endoclita camphorae (Sasake)

Plate xvii, fig. 1 and text fig. 5-6

Phassus camphorae Sasake, 1908, Tokyo Nippon Konchu Kw. Ho., 2, p. 81.

Phassus camphorae Matsumura, 6000 Insects, p. 1024 fig. (female).

Phassus camphorae Pfitzner and Gaede, 1933 Seitz Macrolep. x, p. 843, pl. 78c.

Male. Antennae thread-like, with about 22 segments, bright ochreous yellow. Head with eyes moderate; head, thorax and abdomen grayish-fawn, legs slightly darker; posterior legs moderate in size, with a tibial tuft of dull ochreous-brown hairs. Forewings with costa straight, slight traces of an elevation at Sc_1; apex rounded, termen rather straight, inner angle and inner margin well rounded; venation as in genotype, wing colour grayish-fawn with paler bands and markings; three pairs of black spots along costa, each outlined in pale fawn; a white spot above basal M fork, enclosed in black; another white-centred black spot just above Cu_1 at one-half; also a group of three or more in outer part of cell near rm vein. Hindwings with venation as in genotype, colour grayish-fawn with apex well rounded, sub-hyaline; a few darker markings along costa; a faint purplish tinge on wing when viewed from certain angles. Wing length 34 mm., expanse 73 mm.

Female. Similar to male but colour a pale shade of grayish-fawn, long hairs at base of abdomen and on meso- and metathorax paler still; hindwings hyaline; vannal region with PCu developed only at base, 2V well developed, extending to one-half inner margin. Wing length 35 mm., expanse 76 mm.

Loc. Japan: Tesio, Hokkaido (June and July); Hakodate, Hokkaido (June and July); Junsai Numa, Hakodate (28 July); Yoshino, Yamato-ken (5 July); Yokohama; Shimonoseki (July); Ishizuchisan, Shikoku (26 June); Satsuma (May); Kagoshima, Kyushu (August).

So far as can be ascertained with material available at Adelaide *E. camphorae* is confined to Japan. It resembles closely in wing patterns *E. sinensis* but has markedly different male genitalia.

The male has the genitalia (fig. 5) with the posterior margin of the 8th sternite slightly and broadly excavated, with an arcuate area of rough surface forming a median lip. The tegumen when viewed laterally has the ventral margin smooth, and forming a conical eminence; in ventral view the tegumen is seen to be rolled inwards towards the centre line anteriorly, giving an S-shaped contour to the ventral margin.

The female genitalia (fig. 6) drawn from a rather small example expanding only 64 mm., from Yokohama, show a large 7th sternite with an anterior sinuate fold and slightly excavated posterior margin; the 8th sternite has two parts, a laterally compressed and longitudinally grooved ventral portion and a narrower, parallel-sided, ventrally grooved dorsal trough-like portion which is of considerable length. The anterior gonapophyses are angulate pieces with a rounded swelling at the posterior extremity; the integument of the sides of the ultimate segment form a hood over the ovipore.

The examples described are a male from Tesio (July, 1901) in the Tring Collection at the British Museum, and a female from Yokohama (Dr. H. Loomis). The type, from Southern Japan, has not been examined; the specimens under examination agree very well with the figure by Matsumura.

Endoclita aikasama sp. nov.

Plate xvii, fig. 2 and text fig. 7

Male. Antennae (wanting in only available specimen). Eyes large and dilated but in lateral view not concealing whole of head. Head, thorax, legs and abdomen generally dark chocolate-brown, some lighter hair on the metathorax, posterior legs only slightly reduced, a large plume of specialized ochreous-yellow hairs on tibia. Forewings with costa sinuate, very slightly dilated at Sc_1, apex falcate, termen and inner margin in one continuous curve; im vein only shortly before fork of M_1 and M_2 and extending to fork of M_3 and M_4; wing colour chocolate-brown with slightly curved transverse darker lines between the veins, some incorporating tiny flecks of cream, margined with black; a group of three creamy-white spots at basal M fork and another group around the junction of rm vein and M_1; a somewhat more conspicuous brown patch where Cu_2 vein becomes obsolescent; in addition a

larger pattern of more shiny scales showing a purplish sheen in certain lights, and forming transverse bands along inner margin and across outer third of wing; also forming patches along costa. Hindwing with costa sinuate, termen and inner margin angulate; tip of wing brown with wing pattern of forewing; rest of wing dark gray with a strong purplish flush when viewed from many directions; basal fourth of wing clothed in dense fawn hairs. Wings beneath dull brown, with traces of wing pattern evident only along costa. Wing length 68 mm., expanse 144 mm.

Loc. Java: Vulkan Gede, 1894 (collected by Prilwitz, from Staudinger Coll., No. 759, in Museum f. Naturk., Berlin). Examples similar to this type specimen were in the Tring Museum, in 1936, as *niger* Eecke, which they are not. When compared directly with the type of

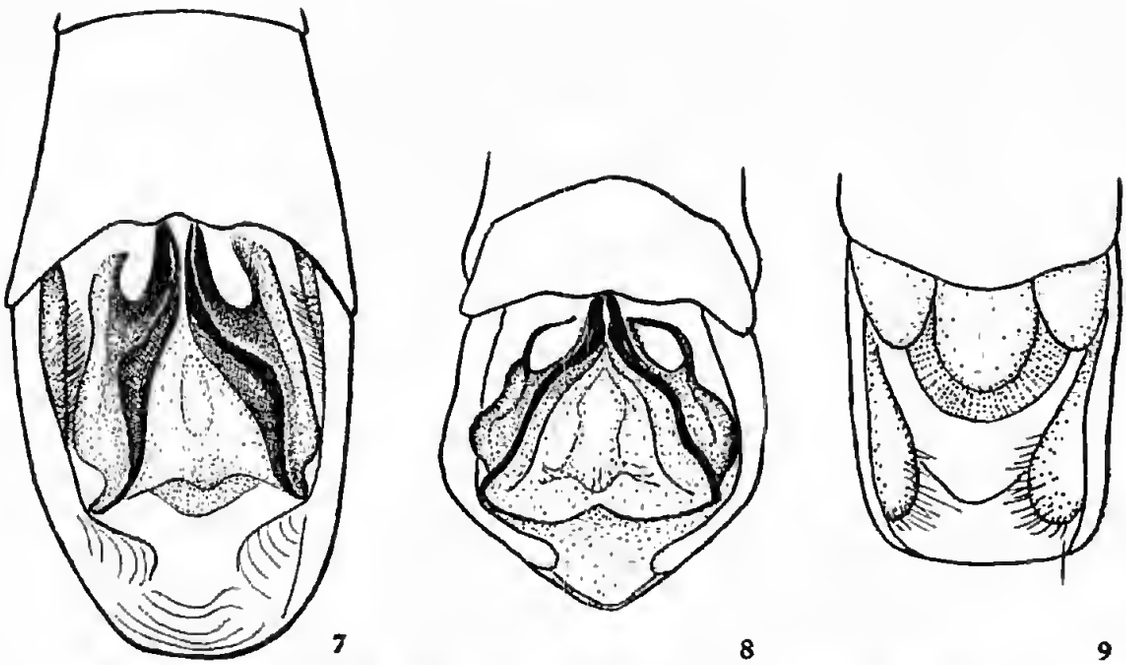


Fig. 7-9. 7. *Endoclita aikasama* Tindale, Vulkan Gede, male genitalia, ventral aspect. 8. *Endoclita sericeus* (Swinhoe), Java, male genitalia, ventral aspect. 9. Type, a female, Malang, freehand sketch of genitalia, ventral aspect.

pfitzneri which is a form of *E. niger*, the type of *E. aikasama* proved to be much larger and with different marking. At the time I formed the opinion that it might be only a giant form of *E. niger*, and conspecific, but closer examination and comparison with the example of *E. niger* described elsewhere in this paper has convinced me that they represent two species, not even closely related.

This is by far the most robust of the Indonesian species of the genus and the female, when taken, should be rather large. The rich brown colour, the falcate wings and the striking masses of golden yellow coloured plumes on the tibiae of the posterior legs are highly characteristic.

The genitalia have the hind margin of the 8th sternite broadly excavate and sinuate with a slight median notch (fig. 7). The tegumen, in ventral view, shows a slightly serrated margin which is reflexed outwards so that in lateral view the outline of the tegumen is smooth and apparently unarmed. It thus contrasts with *E. niger* in which the margin is not reflexed and consequently in lateral view the margin appears finely serrate.

Endoclita sericeus (Swinhoe)

Plate xvii, fig. 3 and text fig. 8-9

Phassus sericeus Swinhoe 1901 Ann. Mag. Nat. Hist. (7) vii, p. 469.

Male. Antennae threadlike, short, of twenty-two segments, bright ochreous brown. Head with eyes large, from the side concealing most of head except the frons, metallic gold in colour; head, thorax and legs dark brown; abdomen, and particularly the long hair at base at abdomen, much paler, posterior legs normal, a very large tibial plume, bright ochreous yellow. Forewings with costa somewhat sinuate, only a trace of an expansion at Sc_1, apex falcate, termen and inner margin well rounded; wing colour dark chocolate-brown with obscurely defined paler fawn streaks and bands, particularly an irregular one from near costa at four-fifths to inner margin at two-thirds and traces of another parallel to termen; a semicircular pale fawn patch in cell at basal M fork, two black rimmed silvery-white spots with traces of a third, and a cluster of tiny similar spots at junction of rm vein and M_1. Hindwings with costa slightly sinuate, termen well rounded, vannal area with PCu reduced. 1V and 2V present; wing colour grayish-fawn. Wings beneath with a series of brown spots along costa, elsewhere grayish-brown, in certain lights with a pale but strong bronzy lustre. Wing length 30 mm., expanse 66 mm.

Female. Similar to male; posterior legs not plumed. Wing length 30 mm., expanse 66 mm.

Loc. Java: Malang (Type, a female, 66 mm. in expanse, not a male as described, No. 1901-178 in British Museum); Soekaboemi; Nongkodjadjar (4,000ft., Dec. 1930, A. M. K. Wagner); Java 1891 Fruhstorfer Coll. (allotype male in United States National Museum, *ex* Brooklyn Museum).

The male from the United States National Museum Collection described above may be regarded as the allotype, since the type is a female.

The male genitalia (fig. 8) have the 8th sternite wider than long, with the posterior margin waved. The tegumen has the ventral margin smooth; in ventral view it is sinuate, with the two halves diverging to the rear.

Fig. 9 gives a freehand sketch of so much of the female genitalia as may be seen on the type. The 8th sternite has a wide upper portion broadly rounded posteriorly and a broad ventral portion, also well rounded. The anterior gonapophyses are suboval in outline.

Although *E. javaensis* was taken at Nongkodjadjar in the same month as this species, it seems to be quite distinct.

This species seems to fall closest to *E. gmelina* of Burma in the form of the genitalia, although the resemblances may be in part accidental; in wing form, notably the absence of a costal expansion on the forewing, it is distinct from *E. gmelina* and falls closer to *E. damor* from which it can be readily distinguished by the form of the 8th sternite of the male, which is not deeply notched as in that species.

Endoclita aurifer sp. nov.

Plate xviii, fig. 1 and text fig. 10

Male. Antennae very short, threadlike, ochreous; eyes large, brown, thorax brown, darker on the sides, abdomen pale brown, posterior legs with a moderately large tibial plume of golden yellow hairs. Forewings relatively broad, falcate at tip and with costa moderately dilated about Sc_1; wing colour dull purplish-brown, markings in the form of linked circular ochreous patches forming spots between the veins, each spot contains several tiny ochreous-white-centred brown spots; the ochreous markings are most concentrated in a triangular patch enclosed between the area bounded by costa, from near base to just beyond Sc_1, a line from there to near fork of M_4 and Cu_1a, and a line along vein Cu_1 to near base; another large ochreous patch at apex and several series of spots running parallel to termen; silvery-white spots much larger than the white ones on rest of wing occur just before middle of wing and again at end of cell; there are traces of several very dark orange spots along Cu_2. Hindwings subfalcate, termen angled, dull purplish-brown, ochreous at tip. Wing length 37 mm., expanse 78 mm.

Loc. Java: type a male, unique, in British Museum (*ex* Tring).

This male is a very striking one. Its relationships are probably with the next species, *E. broma* with which it shares an almost identical basic wing pattern, although the wings are somewhat longer in proportion and the colours are unlike.

The male genitalia so far as they may be seen from below without dissection (fig. 10) have a tegumen which has on its margin no armature of spines, the tegumen is drawn out anteriorly into a depressed projection which passes inside the posterior margin of the 8th sternite; the posterior part of the tegumen is laterally expanded.

In the form of its genitalia this species, like *E. sericeus,* shows relationship with *E. gmelina* of Burma, but the 8th sternite is quite

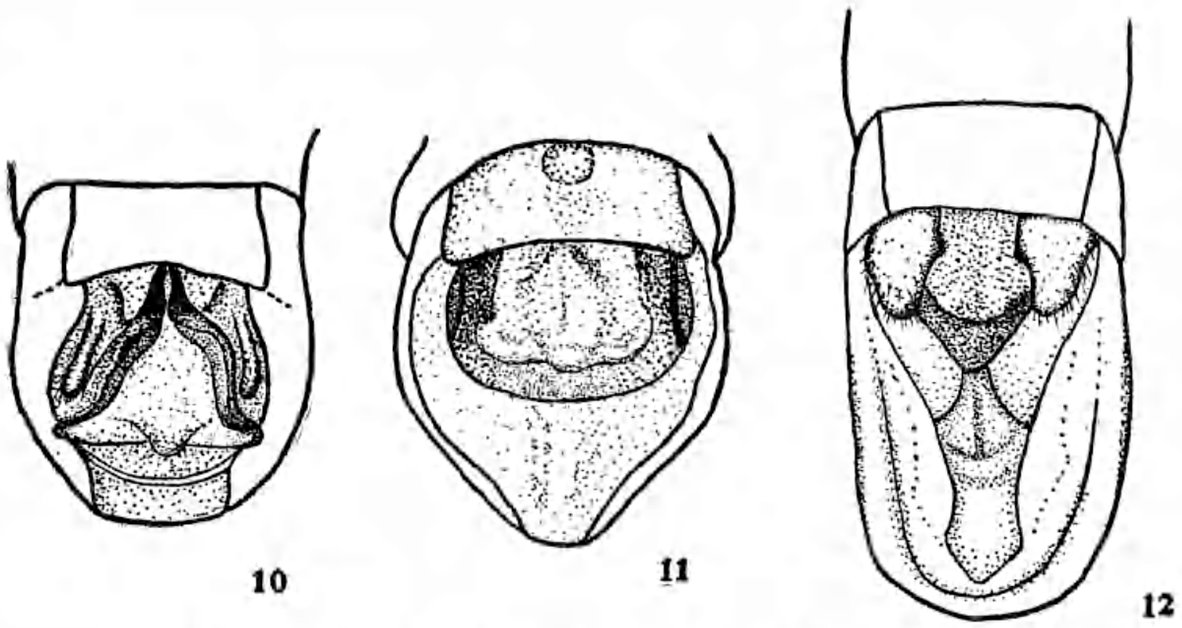


Fig. 10-12. 10. *Endoclita aurifer* Tindale, Java, male genitalia, ventral aspect. 11-12. *Endoclita broma* Tindale. 11, Male, Djember, genitalia, ventral aspect. 12, Female, Mt. Andjasmara, genitalia, ventral aspect.

different, having merely a slightly concave posterior margin instead of a highly complex outline as in that species.

This species may be close to *E. javaensis,* an East Javanese species taken at 4,000ft. at Nongkodjadjar in Tengger, but appears to be distinct by reason of the more widely separated posterior portions of the tegumen. The sinuate line of the keel of the tegumen, when viewed from the ventral side, also contrasts with the relatively straight margin figured by Viette for that species.

Endoclita broma sp. nov.

Plate xviii, fig. 2-3 and text fig. 11-12

Male. Antennae lacking in available specimen; eyes moderately dilated, head and thorax dull brown, abdomen pale grayish-fawn darker at tip; posterior legs slightly reduced, with deep orange tibial plume. Forewings relatively broad, falcate at tip, only slightly dilated on costa at Sc_1, colour grayish-fawn with rich chocolate-brown markings, generally in the form of linked circular discs, in basal half of wing uniting to form a triangular patch, also two broad bands running parallel to termen in distal half of wing; the fawn areas and chocolate-brown spots are marked with numerous fine dark lines running between the veins. There are two small silvery-white spots, margined with black, below middle of cell and a group of much smaller ones near apex of cell. Hindwings grayish-fawn with costa near tip bearing three brown patches. Forewing length 35 mm., expanse 76 mm.

Female. Eyes moderately dilated, ochreous-brown. Head, thorax and abdomen dull brown; wings as in male, background colour pale fawn; circular markings as in male, but dark brown, with contained spots represented only by linear black marks; silvery-white spots present in cell, as in male, but smaller and black-edged; traces of four darker marks below Cu_1. Hindwing dull grayish-brown with traces of a subterminal series of darker circular marks appearing like "water-marks." Wing length 38 mm., expanse 80 mm.

Loc. Java: Djember, Besoeki Residency 1,300-2,500 feet, Möllinger, 1892 (type, a male in British Museum, *ex* Tring); Mt. Andjasmara, Malang district, November and December 1828, G. Overdijkink (allotype female in Joicey Coll. 1930-75, at British Museum). The sexes are associated with some confidence.

The wing pattern of this species, from Eastern Java, is similar to *E. aurifer*, with which it shows relationship. It is possible that it is the dark extreme form of that species but in view of some seeming differences in the genitalia, so far as they may be compared, I prefer to regard it as a separate species.

In the only male available for study the genitalia are deeply retracted, the tegumen so far as it appears is unarmed, the two sides being placed widely apart; the 8th sternite is evenly concave on its posterior margin. When compared with *E. aurifer* the terminal segment of the body is very differently formed in this species (fig. 11).

In the female genitalia the 7th sternite has the posterior margin entire and transverse, the anterior gonapophyses are flat plates, rounded at the tips, but coming to a blunt point near the middle of the inner margin. The 8th sternite has its posterior margin triangular with a rounded point (fig. 12).

The female genitalia show resemblances with those of *E. gmelina* but the anterior gonapophyses are much broader and the shape of the 7th sternite shows little resemblance to its form in that species.

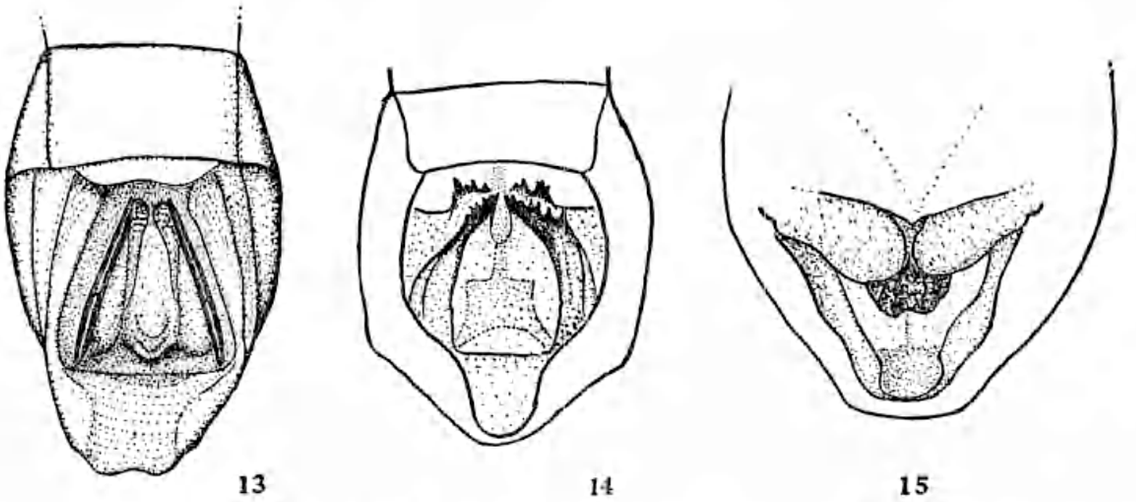
Endoclita salvazi sp. nov.

Plate xviii, fig. 4 and text fig. 13

Male. Antennae short, threadlike, with about 29 segments, with incipient traces of pectination and a few fine hairs, eyes dilated; head, thorax except sides, which are brownish-black, and abdomen and legs brownish-fawn, posterior legs with a conspicuous plume of golden yellow hairs. Forewings with costa straight and a very conspicuous dilation at Sc_1; wing tips falcate, termen rounded, slightly concave at inner angle, colour pale grayish-fawn with markings slightly more brown; a series of generally paired small black spots along costa, a larger one near inner margin and two series of black-bordered silvery-white spots at middle and at end of cell, also a scattered group of small ones in apical fourth of wing, the intensified brown colour of cell outlines a triangular patch of grayish-fawn near the middle of the wing. Hindwing with costal margin sinuous and deeply concave at about three-fifths its length, apex slightly falcate, termen dilated in anterior half, slightly concave at hind angle; markings at wing tip as in forewing, rest of wing grayish-fawn with faintest traces of a purplish sheen from some angles of view. Wing length 43 mm., expanse 92 mm.

Loc. Laos: Thado, 6 June, 1915, R. Vitalis de Salvaza (type a male, unique, in Cornell University Collection, lot 841).

This species appears to be related to *E. paraja* and *E. tosa*, particularly in the form of the wings, and in the placing of the conspicuous black spot on the forewing, but the strong dilation of the costa and the far larger eyes, which from the side conceal most of the head save the palpi and the frons, are very evidently different. The male genitalia (fig. 13) in ventral view show what appears to be the 8th sternite as wider than long with a sinuously margined posterior lip. The tegumen has a straight ventral keel and the keels of the two sides diverge markedly toward the posterior extremity of the body.



13 14 15

Fig. 13-15. 13. *Endoclita salvazi* Tindale, Thado, male genitalia, ventral aspect. 14-15. *Endoclita aroura* Tindale. 14. Male, Lebong Sandai, genitalia, ventral aspect. 15. Female, Lebong Sandai, genitalia, ventral aspect.

In the key the male genitalia of this species fall into a section entirely different from *E. tosa* and *E. paraja*. The former is distinctive because of the parallel arrangement of the teguminal margins and the conspicuous spines along the margins. *E. paraja* differs in the much larger tegumina meeting firmly in the midline instead of diverging, and is distinctive in the form of the posterior margin of the 8th sternite.

Endoclita aroura sp. nov.

Plate xix, fig. 1-2 and text fig. 14-15

Male. Antennae very short, threadlike, composed of about 22 subspherical segments; eyes moderate; head and thorax densely rough-haired, dark brown, abdomen and legs greyish-fawn; a plume of yellow hairs on posterior tibia. Forewing with costa straight, slightly concave beyond Sc_1, apex round-pointed, termen well rounded, wing colour fawn with a faint purplish iridescence, markings in the form of tiny brown streaks, each tending to surround a patch composed of a few yellow scales; a large patch of yellow scales at end of cell. Hindwings with costa concave, apex blunt-pointed, wings broad, grayish-fawn with a dull purplish iridescence, except near apex, which has the pattern of the forewing. Wing length 25 mm., expanse 53 mm.

Female. Much larger than male, form of wings and markings similar, hindwings with purplish iridescence even less evident. Wing length 50 mm., expanse 105 mm.

Loc. Sumatra: Lebong Sandai, Benkoelen (male type and allotype female, Joicey Collection in British Museum 1929-122); another female, same details, but expanding 92 mm.

Lebong Sandai is in the south-west of the island of Sumatra. The circumstances of the taking of the specimens have not been recorded.

This species is reminiscent of Indian species such as *E. rustica* and its allies. The absence of costal dilation on the forewing, and the wing form itself strengthens the resemblance, but the male genitalia are of different form and it is clear that they are at best but distantly related species.

The male genitalia (fig. 14) have an 8th sternite much wider than long. The tegumen is armed with irregular teeth set in a double row at the anterior end; viewed from the ventral aspect the keels of the tegumina diverge widely towards the posterior extremity.

The female genitalia (fig. 15) so far as they may be seen without dissection in the allotype example, show the 7th sternite with a convex posterior margin coming to a blunt point in the midline. The anterior gonapophyses are broad digit-like plates, largely covering the heavily chitinized 8th sternite, whose posterior extremity appears as a rounded eminence, deeply incised on its ventral side.

Two dried eggs, presumably of the species, were found adhering to the hairs of the tip of the abdomen of the female. They suggest that, when newly laid, the eggs were smooth-shelled and almost spherical, with a diameter of 0.7 mm.

Endoclita raapi sp. nov.

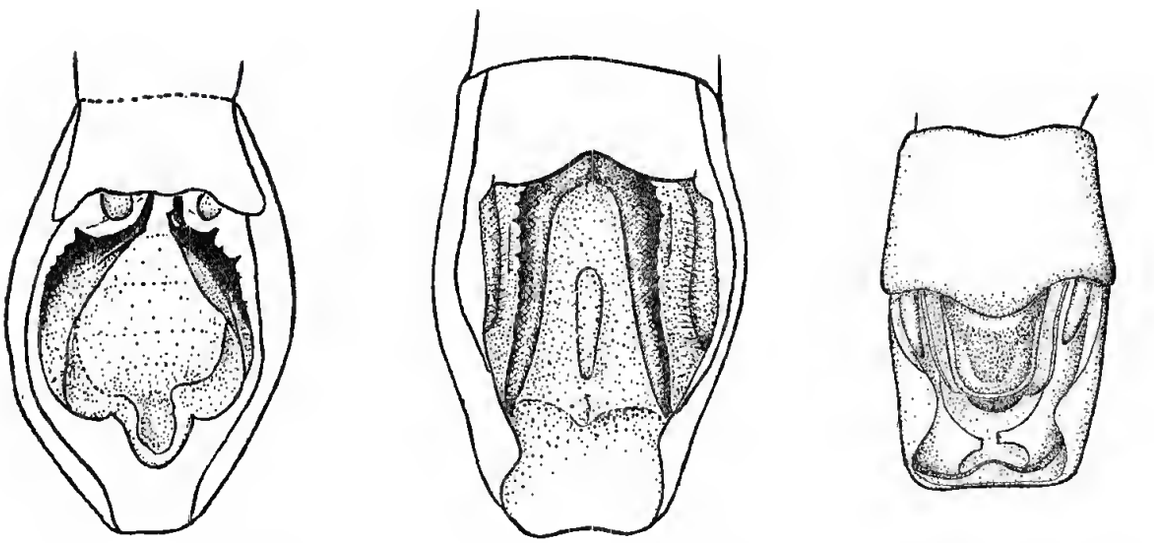
Plate xix, fig. 3 and text fig. 16

Male. Antennae simple, threadlike, eyes dilated; head, thorax and abdomen dark grayish-brown, posterior legs with a moderate sized ochreous tibial plume. Forewings with region of Sc_1 not noticeably dilated, but the margin excavated beyond; wing tips feebly falcate, chocolate-brown with traces of dark purplish-brown markings and patches, particularly a semicircular patch lying behind R vein at about middle of cell, below which are two brown margined angular silvery-white spots; at the end of the cell there is another group of three small silvery-white spots; in the terminal half of wing there are numerous obscure markings between the veins, a few of these take the form of

small light-centred brown spots; near the apex other of these markings are tinged with ochreous brown. Hindwings grayish-brown, a few traces of ochreous brown and darker brown mottlings at the wing tip. Wing length 35 mm., expanse 74 mm.

Loc. Nias (Raap) type, a male, in British Museum (*ex* Tring) and male paratype in South Australian Museum.

This species is rather inconspicuous. It shows no signs of iridescence even when the wings are moved in a bright light. The bright chocolate colour of the forewings with the obscure traces of ochreous rings each of which is dark margined and centred, are reminiscent of *E. aurifer* from Java, but in that species the tegumen of the male is not armed with spines along its antero-lateral margin.



16 17 18

Fig. 16-18. 16. *Endoclita raapi* Tindale, Nias, male genitalia, ventral aspect. 17. *Endoclita tosa* Tindale, Tengger, male genitalia, ventral aspect. 18. *Endoclita aurata* (Hampson), Laos, female genitalia, ventral aspect.

The male genitalia of the figured specimen appear to have suffered injury to part of the tegumen of the right side. For critical detail chief reliance should be placed therefore on the tegumen of the left side (shown on right side of fig. 16). This shows a series of spines on the antero-lateral portion; what appear to be the harpes are small, inconspicuous swellings barely projecting beyond the posterior marginal limits of the 8th sternite.

Endoclita tosa sp. nov.

Plate xix, fig. 4 and text fig. 17

Male. Antennae simple, threadlike, very short, ochreous coloured and composed of about 22 segments. Head wide with prominent eyes, in lateral view almost concealing outline of head. Head, thorax above, abdomen and legs grayish-fawn, becoming more gray on abdomen; posterior legs reduced and with a yellow tibial plume. Forewing with costa straight, a slight dilation at Sc_1, termen and inner margin well rounded in a single curve; apex pointed, slightly falcate; termen well rounded; wing colour pale grayish-fawn with dull brown markings and suffusions, notable a broad V-shaped area in middle of wing and a broad band composed of obscurely circular discs of brown each with a few yellow scales at their centre; this area extends along termen from apex to inner margin at three-fourths; two series of black-bordered white spots, one near notch of V-shaped brown patch and the other at r-m vein, a notable black spot inwards from two-fifths inner margin. Hindwings with costa rather straight, apex blunt-pointed, termen dilated and hind angle slightly excavated; traces of forewing pattern at tip of wing, rest dull gray, smooth-scaled, and showing a dull purplish iridescence in some angles of light. Wing length 37 mm., expanse 80 mm.

Loc. Java: Singolangoe, Tengger (5,000ft., April 1934, F. P. A. Kalis. Type a male, unique in British Museum, *ex* Tring).

This species is close to *E. paraja* which is believed to be a Bornean species, but it differs in the less intense purplish flush of the hindwings, in the different shape of the 8th sternite, and in the tegumen, which has, in ventral view, a series of lateral spines on its margin, instead of being unarmed when viewed from this aspect.

The male genitalia (fig. 17) have the 8th sternite wider than long, with the posterior margin somewhat excavated in the midline. The tegumen is strongly chitinized and the ventral keel rolled slightly outward and armed with a series of teeth. The harpes are long, and so far as may be seen without dissection, are digitiform and clothed with laterally directed hairs.

Endoclita aurata (Hampson)

Plate xx, fig. 1 and text fig. 18

Phassus auratus Hampson, 1892, Fauna Brit. Ind. Moths, i, p. 321 (male).

Endoclita aurata Tindale, 1941, Rec. S. Austr. Mus., 7, p. 37, pl. 7, f. 69 (male).

Female. Antennae filamentous, of about 20 segments, dark brown with paler annular rings. Eyes large, in lateral view concealing most of head, brilliantly reddish-gold in colour; head, thorax and legs yellowish-fawn, abdomen grayish-fawn, posterior legs slightly reduced; no tibial plume. Forewings with costa straight, apex, termen, and inner margin well rounded. Wing colour pale brown with paler fawn transverse bands obscurely margined with darker brown; a patch of scales just below apex and an area along costa from near base to two-thirds with golden yellow scales which show a brilliantly golden and metallic gloss from certain angles. Hindwings with costa sinuate, apex well rounded, termen and inner margin angled, colour pale grayish-fawn, showing a pale bronzy lustre from some angles. Wings beneath pale grayish-fawn without markings. Wing length 25 mm., expanse 53 mm.

Loc. Laos: Thadua. 8 Oct., 1915, R. Vitalis de Salvaza (allotype female, in Cornell University, lot 841, sub. 266). Burma: Bernardmyo, 5,500-7,000ft. (type, a male, in British Museum).

The male was redescribed in my 1941 paper. The female which is now confidently associated with it, extends the range of the species from Burma to Laos.

The female genitalia (fig. 18) have the 7th sternite almost as long as wide, with the posterior margin convex in the midline and showing slight lateral concavities; the 8th sternite is large, wide at the anterior end and evenly rounded posteriorly with a raised rim when seen in ventral view; the anterior gonapophyses are slender and spine-like, ending in a sharp point.

This species shows some relationship with *E. sericeus* of Java, and is superficially like *Nevina aboe* but is readily differentiated from the latter by the typical *Endoclita* venation.

Endoclita niger (van Eecke)

Plate xx, fig. 2 and text fig. 19-21

Phassus niger van Eecke, 1915, Zool. Med. Leiden, i, p. 248.

Phassus pfitzneri Gaede 1933, Seitz Macrolepidoptera, 10, p. 843, pl. 100a.

Male. Antennae threadlike short, ochreous. Head with eyes moderate; head, thorax, abdomen and legs pale fawn; posterior legs somewhat reduced, a specialized plume of hairs present but concealed in a fold of the metathorax. Forewings with costa sinuate; a moderate costal expansion at Sc_1; wing tip strongly falcate; im vein from close to fork of M_1 and M_2; ground colour several shades of pale brown arranged in circular patches between the veins with a tendency for each ring to have a small ochreous-white spot outlined with fuscous; more conspicuous creamy-white spots at basal M fork and at junction of rm vein with M_1; a slight infuscation runs along vein R_5 nearly to termen. Hindwings with im vein directly from fork of M_1 and M_2, only one vannal vein (1V) to margin, PCu obsolete except at base, wing texture subhyaline, colour gray except at tip where the forewing pattern is present; the gray parts of the wing are perhaps brilliantly iridescent in life but only traces of a purplish sheen remain in the specimen described. Wing length 39 mm., expanse 83 mm.

Loc. Java: Vulkan Gede (Prilwitz, 1894).

The type of *E. niger* has not been examined, but there seems little doubt about the synonymy given above.

From the expanse given (140 mm.) it is possible that the type is a female, not a male, as described. A female of close to the given dimension, from Western Sumatra (*ex* Fruhstorfer Collection), is in the Tring Collection.

E. aikasama also from Vulkan Gede, and described in this paper was originally associated with this species. However it is much larger (146 mm. expanse), and is not the same species. The two differ in colour and in the form of the genitalia.

The type of *E. pfitzneri* from Western Java in the Berlin Museum has been examined. It is larger than the male example described above (expanding 121 mm.), but otherwise it agrees very well with it. It also agrees with the figure published in Seitz Macrolepidoptera 10 (plate 100a) save that its wing tips are little more falcate than shown there and, as in the described specimen, there are many fine yellow marks forming elongate ocellate centres to each disc-like marking on the forewing. The hindwing is more a dull purplish-gray than the colour indicated in the figure. The antennae are shown as far too long in the Seitz figure.

Fig. 20-21 show two views of as much of the male genitalia of the type example of *pfitzneri* as may be seen without dissection. The tegumen in lateral view (fig. 21) is evenly arched posteriorly, the

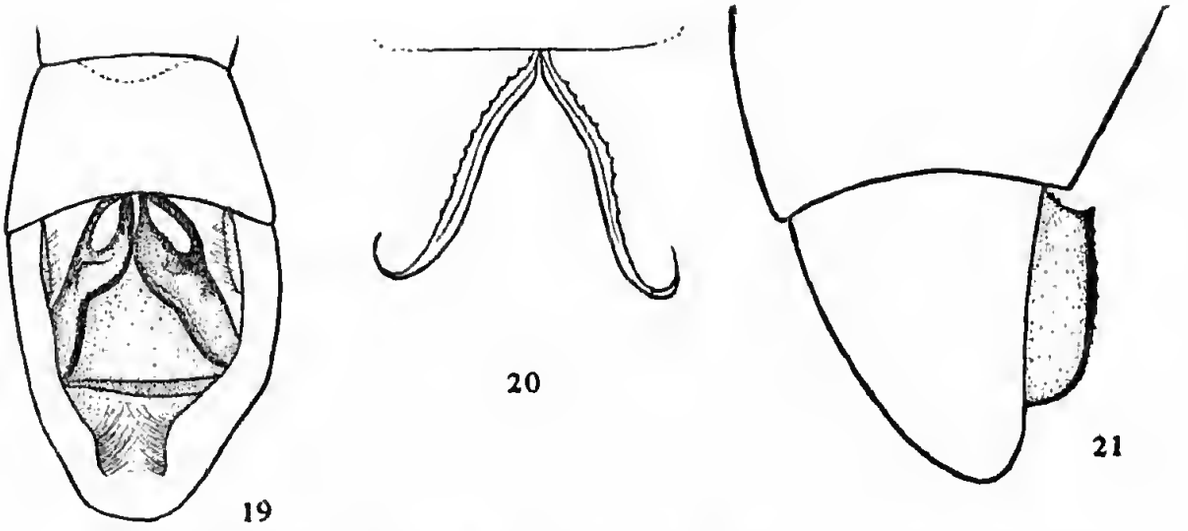


Fig. 19-21. 19. *Endoclita niger* (van Eecke), Vulkan Gede, male genitalia, ventral aspect. 20-21. Type male of *E. pfitzneri*, free hand sketches of male genitalia, ventral and lateral aspects.

margin has a slightly serrated appearance from spines which project laterally from the outwardly turned over lip of the tegumen, as may be seen in ventral view (fig. 20). The third figure (fig. 19) is a ventral view of the genitalia of the male example from Vulkan Gede described above. This shows more of the anterior portion of the tegumen than is evident in the type of *E. pfitzneri*. The contour of the tegumen from below is a trifle more angulate than in that example.

Endoclita crenilimbata (Le Cerf)

Plate xx, fig. 3 and text fig. 22-23

Hypophassus crenilimbata Le Cerf 1919, Bull. Mus. Nat. D'Hist. Nat. Paris, 25, p. 471.

Male. Antennae (wanting in example studied), head with eyes relatively small; head, thorax and legs pale fawn in colour with a narrow black line on side of thorax; posterior legs slightly reduced, with a very large tibial plume of ochreous-fawn hairs, abdomen gray, slightly paler near base. Forewings with costa strongly expanded at Sc_1, apex with trace of falcation, postero-lateral angle of wing with crenulated indentations between the veins; im vein nearer to fork of M_1 and M_2 than in the genotype and touching M_3 after fork of M_3 and M_4; wing colour pale ochreous fawn tending to a grayish-fawn on terminal third; indistinct traces of black lines enclosing gray patches of scales along costa and notably in apical third of wing. Hindwings with im vein as in forewing, vannal region with two well

developed veins after Cu_2; these are probably 1V and 2V, with vestiges of a PCu at base, between Cu_2 and 1V; wing colour dark gray without any marked metallic sheen even when viewed from many different directions. Wing length 43 mm., expanse 93 mm.

Loc. China: Yao Gi, 4,000-5,000ft (male in United States National Museum); Pin-Fa, Kwaichau, R. P. Cavalerie, 1918 (type, probably a female, not a male, in Paris Museum).

The specimen described as the male is in the collection of the United States National Museum and has been kindly loaned to me for study, along with the other material not yet described.

This species is unmistakeable because of the crenulated margin of the forewings in the region of the anal angle, and the dilation of the costa at Sc_1, which in this species probably attains almost a maximum.

In the original description the type example was said to be a male but later on in the paper is indicated to be a female; since the posterior legs are indicated to be ochreous gray and no mention is made of the very large plume of ochreous hairs it is probable that it is a female.

The male genitalia (fig. 22-23), so far as visible without dissection, show the 8th sternite broadly excavated on its posterior margin. The tegumen has a strong ventral keel, finely serrated on its margin, the two sides diverge strongly towards the posterior extremity.

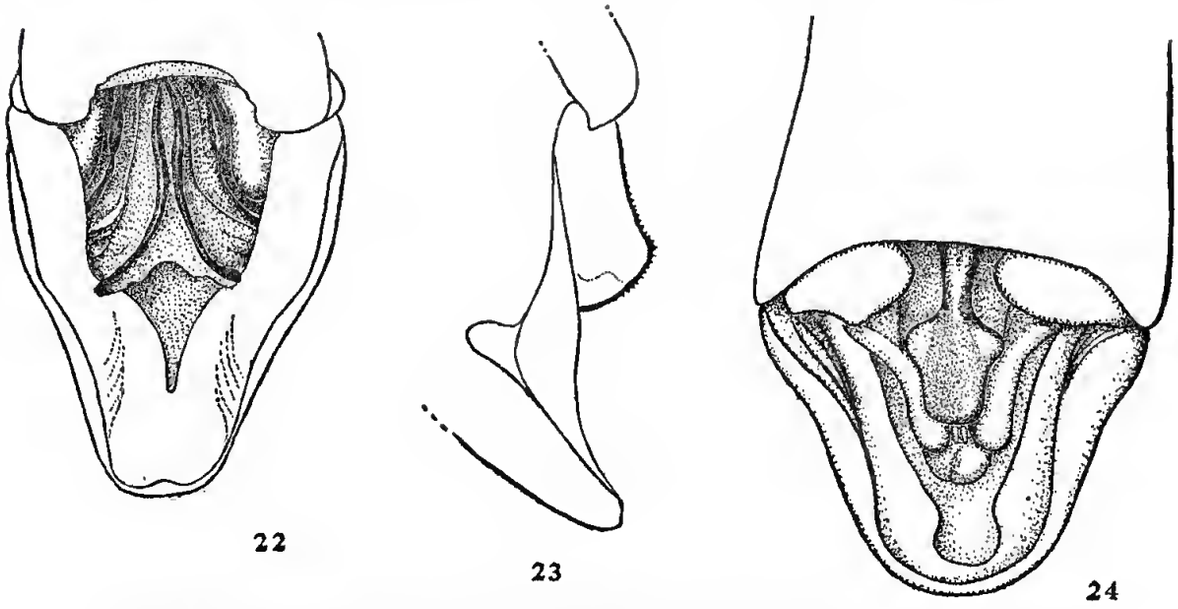


Fig. 22-24. 22-23. *Endoclita crenilimbata* (Le Cerf), Yao Gi, male genitalia, ventral and lateral aspects. 24. *Endoclita topeza* Tindale, Kiang Kong, female genitalia, ventral aspect.

In the form of its genitalia this species seems to fall into the same section of the genus as *E. excrescens* from which it differs greatly in the degree of expansion of the costa of forewing as well as in wing pattern.

Endoclita annae (Le Cerf)

Hypophassus annae Le Cerf, 1933, Bull. Soc. ent. France, 38, p. 131.

Loc. South China: vicinity of Tatsienlu, 1910. Type described as a male, expanse 96 mm. (*ex* collection of Charles Oberthur in collection of R. Biedermann). This species has not been examined.

From the description it would seem to fall near *E. crenilimbata* since the inner margin of the forewing has three crenulations between M_2 and 1V. No costal dilation of the forewing is mentioned and the hindlegs are not indicated as armed with a tuft. On the other hand there is mention of some crenulation on the margin of the hindwing and the presence of silver spots on the forewings. The expanse of the wings is given as 96 mm. If the sex determination is correct this must be a very distinct species; if however it should prove to be a female it is just possible it could be the same species as *E. crenilimbata*.

Endoclita topeza sp. nov.

Plate xx, fig. 4 and text fig. 24

Female. Antennae (wanting in available specimen). Head with eyes moderately large, but in lateral view not concealing whole of head; head, thorax, abdomen and legs dull ochreous fawn. Forewings with costa straight, traces only of a costal dilation at Sc_1, apex well rounded, termen rather straight, inner margin well rounded, wing colour fawn with grayish-fawn suffusions and pale brown markings between the veins enclosing paired oval areas of ground colour; five black spots on costa, each with a diffused fawn-coloured centre and three groups of black-bordered creamy-white spots, small ones near apex, a group of two or three with one larger spot at r-m vein and two smaller spots in cell at about one-third its length. Hindwings with costa concave in middle, apex well rounded, termen straight and hind margin well rounded, small traces of the forewing pattern at apex, rest of wing ochreous fawn, somewhat brighter than forewing. Wing length 51 mm., expanse 109 mm.

Loc. Laos: Kiang Kong (Xiang Khong) 14 April, 1920, R. Vitalis de Salvaza (type, a female) unique, in Cornell University Collection, lot 841, sub. 267).

This specimen stood in the Cornell University collection under the name *Phassus signifer* but it is not that species. I am indebted to Dr. W. T. M. Forbes for the opportunity of studying it. Through his kindness I have held it for some years. Its closest relationship is with *E. chalybeata*, both in wing markings and in the form of the female genitalia. The last named organs differ in the more robust character of the table-leg-shaped 8th sternite, which contrasts with the more truly spatulate form met with in *E. chalybeata*. It may be regarded as the eastern representative of a small species group embracing *E. chalybeata* and the present form.

The female genitalia have the 7th sternite about as long as wide, its posterior margin broadly concave; the 8th sternite is narrow at the anterior extremity and even narrower towards the middle of its length before it swells into a large spade-like portion with strongly dilated sides. The anterior gonapophyses are somewhat irregularly shaped plates and the posterior gonapophyses are well chitinized members; a narrow disc-like portion near the midline is separated by a deep constriction; the integument of the sternite forms an incomplete hood over the ovipore.

Endoclita davidi (Poujade)

Plate xxi, fig. 1 and text fig. 25-26

Hepialus davidi Poujade 1886, Bull. Soc. Ent. France, 6 (vi) p. xcii (male and female).

Hypophassus excrescens Viette, 1948, Musée Heude, xii (8) p. 84 (*nec* Butler).

Female. Antennae (wanting in example described), eyes normal, moderate; head, thorax, apical half of abdomen above, and underside, also legs, bright orange-brown; basal half of abdomen above, dark brownish-fawn; posterior legs small, without notable tibial plume. Forewing with costa straight save for a rounded eminence at Sc_1, termen gently rounded in a curve continuous with inner margin; im from just before fork of M_1 and M_2 and touching fork of M_3 and M_4; wing colour orange-brown with traces of darker orange-brown spots along costa and in a triangular patch in middle third of wing, traces of ochreous-yellow marks outlining some brown spots, also two areas flushed with yellow, one in cell and the other along inner margin below Cu_{1b}; there is another yellowish band, broken into rectangular patches, running slightly obliquely to the termen; internally from this is a row of raised brown spots, some margined with darker ochreous-brown.

Hindwings with costa straight, termen evenly rounded, anal area with veins Cu_2, 1V and 2V to margin, Pcu represented only near base; wing colour dark gray, the scales being long and hair-like except along the termen, where they are orange-brown, and near apex, where the colour and markings are like those of forewing. Wing length 48 mm., expanse 103 mm.

Loc. Tibet: Moupin (type a male, and allotype female in Mus. Soc. Ent. de France; not examined). China: Chia Kou Ho (two males, one female, in British Museum). Formosa: Suishako, 1907; Oryusan, Ipinchiku 6,500ft., A. E. Wileman, 24 Nov., 1908.

The female example from Suishako, described above and figured, resembles very closely ones from Chia Kou Ho standing in the British Museum under this name. Some doubts may remain as to the probability that specimens from Formosa and ones from Moupin are likely to belong to the one species, but the descriptions fit very well. The ochreous forewings and dark hairy-scaled hindwings with ochreous margins are highly distinctive. I do not follow Viette in regarding this species as synonymous with *E. excrescens*.

Pfitzner, in Seitz Macrolepidoptera, ii, p. 434, regarded the species as a form of *Hepialus nebulosus* Alpheraky but the three males and the female example standing in the British Museum are certainly members of the genus *Endoclita* and possess a distinct costal expansion at Sc_1 of forewing so that they cannot fall in the genus *Hepialus*. The male genitalia show relationship with those of *E. crenilimbata* from which the species differs markedly in wing form. Fig. 25 is based on a sketch of the tegumen of one of the British Museum male examples of *E. davidi* from Chia Kou Ho, as viewed from the side. It shows a long, gently arcuate and finely serrated margin to the tegumen, in contrast with the shorter, slightly excavate margin found in the related *E. crenilimbata* (fig. 23).

The Chia Kou Ho examples were taken by A. E. Pratt at 1,700ft. in July, 1889. The female closely resembles the one described above from Formosa; its abdomen had been detached and remounted ventral side uppermost, but is unlikely to be incorrectly associated. An example from Canton, China in the United States National Museum has the costal expansion very conspicuously developed and another from Suifu in the same collection shows an even more extreme development of this feature. Since these specimens were not critically studied it is possible they do not represent the one species.

The genitalia of the Formosan female (fig. 26) show the 7th segment semicircularly excavate on posterior margin; the ventral portion of the 8th sternite is produced posteriorly into a long digitiform process, this is narrower than the dorsal portion of the same segment, which, from a wide root extends backwards to a similar process, whose ventral surface shows indications of grooving. The anterior

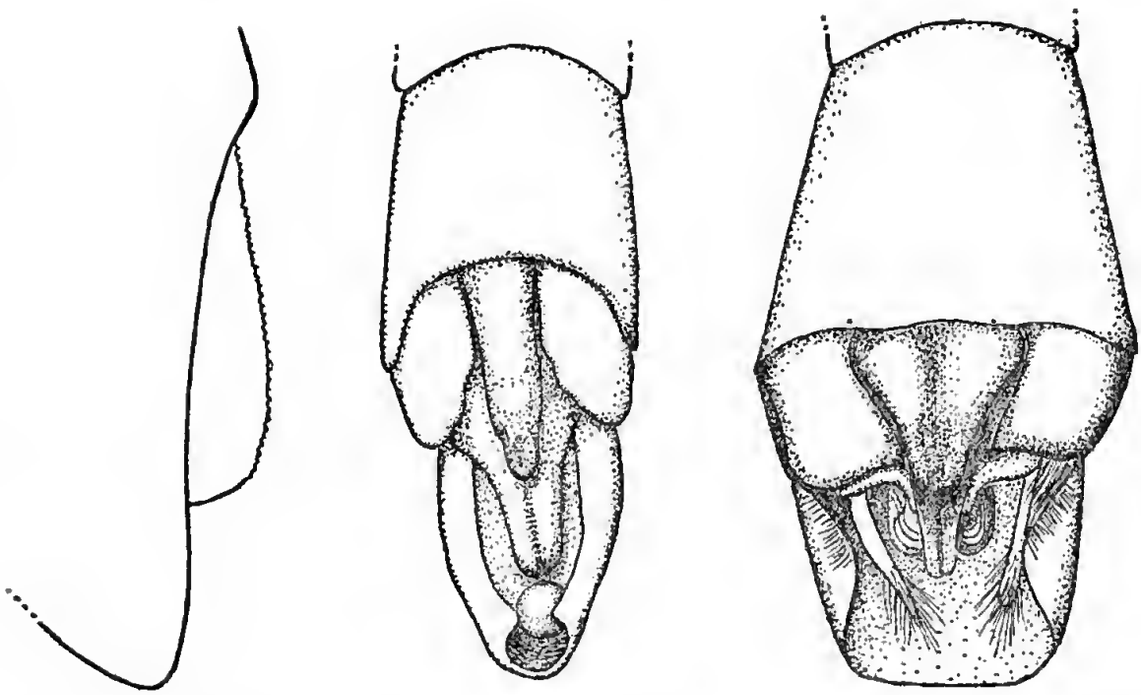


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Fig. 25-27. 25-26. *Endoclita davidi* (Poujade). 25. Freehand sketch of genitalia of male from Chia Kou Ho, in British Museum, lateral aspect. 26. Female, Suishako, genitalia, ventral aspect. 27. *Endoclita kosemponis* (Strand), Rokki, female genitalia, ventral aspect.

gonapophyses are large oval plates with the inner margins slightly crenulated. In the example under examination there is a newly laid egg in the channel formed by the folding over of the terminal segment. This egg is 0.55 mm. in diameter, spherical with a small micropyle at the end directed anteriorly; it is cream coloured.

Endoclita kosemponis (Strand)

Plate xxi, fig. 2-3 and text fig. 27

Phassus signifer var *kosemponis* Strand 19 , Arch. Naturg. 81, Abt. A. 12, p. 150.

Female. Antennae short, threadlike; eyes moderate, in lateral view not concealing outline of head; head, thorax, abdomen and legs grayish-fawn. Forewings with costa straight, apex not acute, termen rounded; wing colour light grayish-fawn with dark grayish-brown markings, principally a large triangular patch in centre of forewing embracing a black bordered creamy-white spot near end of cell; a series of grayish-brown spots along costa and delicate semi-lunate light fawn areas, margined by grayish-brown, principally along inner marginal and terminal portions of wing. Hindwings with costa concave, apex well rounded, termen rounded, a slight concavity at hinder angle, pale grayish-fawn without markings save for traces of two darker spots along costa near apex. Wing length 44 mm., expanse 94 mm.

Loc. Formosa: Kosempo (H. Santer 1911, type, a male and allotype female, same details but captured June 1907, in Deutsches Entom. Mus., Dahlem): Rokki (L. Gressitt) 13 May 1934, a female, described above, in Cornell University Collection, and another, same details, but taken 17 May 1934, in South Australian Museum.

I am indebted to the authorities of the Deutsches Entom. Museum, at Dahlem for the photographs of the type and allotype reproduced in this paper. I examined the examples briefly in 1936 but failed to note the dimensions and Strand's original description is not available to me.

The female described is in the Cornell University collection. Through the courtesy of Dr. W. T. M. Forbes I was able to compare it directly with the type female in Berlin.

The male is similar to the female described above, grayish-brown in colour; in neither sex are there any indications of a costal swelling on forewing. The head is slightly wider in the male than in the female but in both the eyes are of normal size.

This species is abundantly distinct from *E. signifer* of Assam with which it has little in common. Its principal relationships are seemingly with *E. damor* and *E. chalybeata* which possess the same basic wing patterns and equally are without costal expansion on the forewing.

The male genitalia could not be examined in detail during my visit to Berlin, but inspection of the type showed that the hind margin of the 8th sternite was widely and deeply notched in a sweeping curve while the tegumінal margins of the two sides, in ventral view, appeared to diverge widely from the anterior end to the middle of their length and then to converge again, leaving a subrectangular median space.

Female genitalia (fig. 27) based on the example from Rokki, have the 7th sternite transverse, the eighth modified into a ventral heart-shaped median plate with a shallow central groove and a more dorsal, posteriorly produced flat projection narrowly grooved along its midline; the anterior gonapophyses are large and plate-like with a spine or distal projection on the postero-median extremity. There is a pair of slender, distally hair-covered processes which may be the posterior gonapophyses. In some details the female genitalia are reminiscent of *Endoclita damor* but in that species the anterior gonapophyses are irregular in shape, the postero-median projection of the 8th sternite is not grooved for its whole length, and what appear to be the posterior gonapophyses are broad plates.

Endoclita warawita sp. nov.

Plate xxi, fig. 4 and text fig. 28

Female. Antennae wanting in only example available, eyes moderate, head, thorax, except a lateral brown line, and base of abdomen above, pale creamy-brown with scales of fine velvety texture, abdomen somewhat darker (much abraded in the type example). Forewings short and wide, costa with a marked dilation at Sc_1, wing tip strongly falcate; im vein directly from fork of M_1 and M_2; wing colour warm brown. Wing pattern of usual *Endoclita* type; eight rich brown patches on costa, each in part outlined with black and white lines; three groups of silvery-white spots one at junction of rm vein and M_1 and three-fifths the distance between rm vein and M_1, a second around fork of M_2 and M_3, and the third between R_5 and M_1 at three-fifths the distance between rm vein and wing margin; the pattern on the inner margin and the transverse lighter bands are marked with scattered silvery-white scales which give the wing a slightly glistening appearance. Hindwings strongly angled, slightly falcate at tips; veins with Pcu and 1V both well developed, also basal traces of 2V; apex of wing narrowly brown within a darker spot, texture of rest of wing sub-hyaline, with dusky-brown scales, strongly opalescent, and violet or purplish-brown when viewed from most angles. Forewing length 36 mm., expanse 76 mm.

Loc. North Borneo: Mt. Kina Balu, 1,200 to 1,500 metres (Waterstradt) 1894. Type, a female, unique, in Museum f. Naturk., Berlin, marked as part of Staudinger Collection, No. K739.

This species is readily distinguishable from *P. ijereja* which occurs in the same locality, because of the marked costal expansion of the forewing. The origin of im vein on M_1 and M_2 is also different. It is much smaller than that species and has ochreous-brown wings rather than grayish-brown ones. In both species the hindwing shows a purple sheen in certain lights, particularly marked in the present species, being evident also on the underside of both wings. Although the only

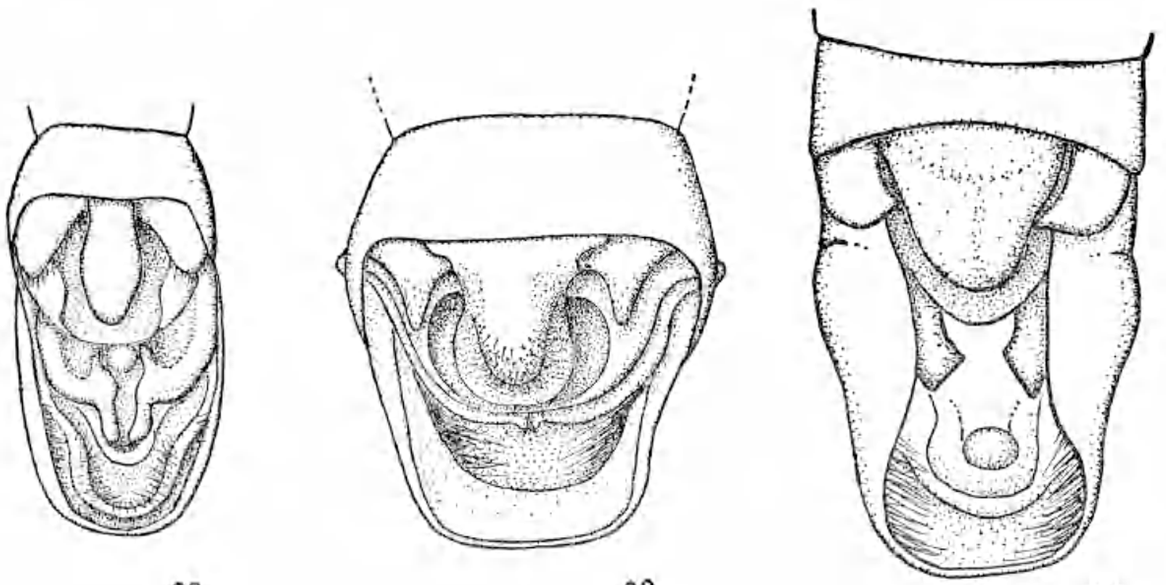

Fig. 28-30. 28. *Endoclita warawita* Tindale, Mt. Kina Balu, female genitalia, ventral aspect. 29. *Endoclita williamsi* Tindale, Los Banos, female genitalia, ventral aspect. 30. *Endoclita taranu* Tindale, Lebong Sandai, female genitalia, ventral aspect, with egg appearing in orifice of ovipore.

available specimen is much worn there should be no difficulty in recognising it again with the aid of the figure.

The female genitalia (fig. 28) have the 7th sternite transverse, and with an entire hind margin much drawn backwards at the sides; the 8th sternite has a digitiform median process and rolled lateral margin; the anterior gonapophyses are rounded and plate-like; the posterior gonapophyses have strongly chitinized and dilated terminal processes.

Endoclita williamsi sp. nov.

Plate xxii, fig. 1 and text fig. 29.

Female. Antennae (wanting in available specimen); eyes large, in lateral view masking whole of head; head, thorax, abdomen and legs

pale fawn, hind legs small, without specialized plume of hairs. Forewing with costa straight, slightly falcate at tip, dull brown with unobtrusive paler bands following general pattern characteristic of the genus; some ill-defined black spots along costa, a group of three small silvery-white spots around junction of rm vein and M_1, another white spot at fork of M_2 and M_3; traces of minute, generally paired, ochreous spots outlined in dark brown, on apical third of wing. Hindwing with both Pcu and 1V veins present; smoky-brown except very narrowly at wing tip; an obscure opalescent blue sheen on wing in certain lights. Wings beneath dull brown without well defined markings. Forewing length 44 mm., expanse 93 mm.

Loc. Philippine Islands: Los Banos, at light (F. X. Williams) type a female, unique, in United States National Museum.

This species is named for Mr. F. X. Williams to whom I have been indebted for many observations on Hepialidae. At first glance this species might be thought to be the *E. ijereja* of Mt. Kina Balu, but the eyes are much larger and there are significant differences in the sex organs.

The female genitalia (fig. 29) show a seventh sternite with hind margin entire and straight, with claw-like anterior gonapophyses. The 8th sternite has a large medial ventral elevation and internally a broad plate with the lateral margins curled down. The semi-circular hind margin of the median elevation is clothed in dense hairs on small papillae. The terminal part of the abdomen is widely flanged.

In the form of the genitalia this species probably falls closest to *E. hosei* of Sarawak, also described in this paper but differs in the shape of the anterior gonapophyses and the form of the 8th sternite.

Endoclita taranu sp. nov.

Plate xxii, fig. 2 and text fig. 30

Female. Antennae short, threadlike, purplish-brown, of about 22 segments. Head with eyes large but not covering silhouette of head; head, thorax above, abdomen and legs pale fawn, sides of thorax brownish-black, posterior legs of normal size, without specialized plume on tibia. Forewings long, slender, costa sinuous with a marked costal expansion at Sc_1; apex strongly falcate, termen and inner margin well rounded in a single curve; colour grayish-brown with dull brown suffusions, notably in the middle of the wing, and enclosing a triangular patch of light gray scales in middle of cell; a pair of black-bordered

silver spots at one-third length of cell and a group of three around junction of rm vein with M_1; faint traces of other spots along costa and in a line of brownish suffusion extending from near apex to inner margin at three-quarters; a white and black bordered brown spot inwards from inner margin at one-half. Hindwings with costal margin slightly concave, tip of wing markedly falcate, termen well rounded with a slight concavity at hind angle, colour dull grayish-brown with a bright purple suffusion evident from some angles of view, tip of wing with rudiments of wing pattern of forewing. Wing length 56 mm., expanse 119 mm.

Loc. Sumatra: Lebong Sandai, Benkoelen (type a female, unique, in Joicey Collection at British Museum, 1925-122.).

From the similarity in size one might consider this species to be the female of the large *E. aikasama* of Java, but there is apparently no instance of a species with the costal dilation of forewing developed in the female and absent in the male. The wing patterns are similar and both have falcate wing tips. On close inspection the similarities in the two species become less apparent and it is with some confidence that they are kept apart.

The female genitalia show a broadly transverse 7th sternite with parallel sides, and a broad vertical projection to 8th sternite, about as wide as long; the posterior gonapophyses are slightly dilated at their posterior extremities. In the available specimen (fig. 30), an egg is held in the opening of the ovipositor, it is nearly spherical, smooth and pale cream coloured.

Endoclita hosei sp. nov.

Plate xxii, fig. 3 and text fig. 31

Female. Antennae short, filiform, of 22 segments. Eyes large, dilated, but in lateral view not quite concealing rest of head. Head, thorax, legs, and probably abdomen (much abraded in the type specimen) pale fawny-brown, posterior legs of normal size without specialized plume. Forewings with costa straight, except for a moderate expansion at Sc_1, apex slightly falcate, termen and inner margin in a single swept curve; im vein just beyond fork of M_1 and M_2; wing colour pale brown with richer brown areas in centre of wing and in a series of circular patches running parallel to termen; a double patch of brown towards costa, and of black below it at the point of obsolescence of Cu_2; a series of dark brown and black spots along costa; there are

traces of a series of tiny black-ringed creamy-white spots just below each vein along termen; a group of three larger ones at junction of rm vein and M_1, two others at the basal M fork and trace of others. Hindwing with costa straight, termen and inner margin angulate, im vein before fork of M_1 and M_2 but after branching of M_3 and M_4; Pcu and 1V both extending to margin; wing tip brown, with pattern of forewing; rest of wing dull gray, in certain lights with a dull purplish suffusion. Wing length 46 mm., expanse 97 mm.

Loc. Sarawak: Baram district (Charles Hose). Type a female, unique, in Tring Collection at the British Museum.

A first impression is that this species is close to *E. warawita* from nearby Mt. Kina Balu, because of the almost identical wing patterns, but the wings are relatively longer and the costal eminence on forewing less conspicuous; the form of the 8th sternite and of the genital processes show it to be quite a different species.

The female genitalia have the 7th sternite transverse, with the side margins converging towards the anterior end. The 8th sternite is a broad plate with semicircular posterior margin, the posterior gonapophyses have the distal extremities dilated.

In the type specimen unhatched eggs are visible through a break in the wall of the abdomen. They are spherical, matt surfaced, 0.5 mm. in diameter, and show traces of a micropyle on one side.

Endoclita kara sp. nov.

Plate xxii, fig. 4 and text fig. 32

Female. Antennae (wanting in described specimen); head with eyes moderately large, in lateral view not covering silhouette of head; thorax, abdomen and legs ochreous-fawn. Forewing with costa sinuous, slightly dilated at Sc_1, apex blunt-pointed, termen and inner margin well rounded, wing colour pale grayish-fawn with brownish-fawn suffusions; particularly a V-shaped area in middle of wing marking off an area of pale ground colour in cell; groups of black-bordered white spots at two-fifths cell and near r-m vein, a series of brown margined circular patches between veins, principally in terminal third of wing, each circle with traces of a tiny central brown-ringed cream-coloured spot, a figure eight shaped black spot obscurely margined with cream-coloured scales inwards from inner margin at one-half, and traces of others. Hindwings with costa nearly straight, apex blunt, termen rounded but slightly straightened near inner angle; grayish-fawn with

a brassy lustre from some angles of view; traces of forewing pattern only at tip of wing. Wing length 27 mm., expanse 57 mm.

Loc. Java: Vulkan Gede, Preanger district (1896, Prilwitz, type, a female, unique, in Mus. f. Naturk., Berlin).

Related to *E. sericeus* from which it appears to differ in the narrower dorsal part of the 8th sternite, the form of the posterior margin of the 7th sternite, and in the longer, apically acutely pointed anterior gonapophyses.

The female genitalia (fig. 32) have the 7th sternite transverse with the lateral margins converging towards the anterior extremity.

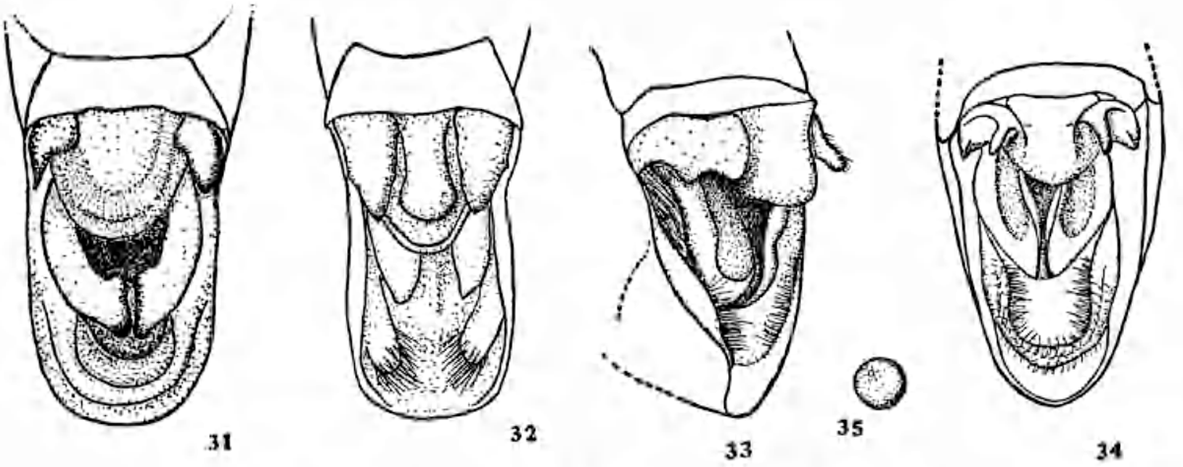

Fig. 31-35. 31. *Endoclita hosei* Tindale, Sarawak, female, genitalia, ventral aspect. 32. *Endoclita kara* Tindale, Vulkan Gede, female genitalia, ventral aspect. 33-35. *Endoclita ijereja* Tindale, Mt. Kina Balu. 33-34. Female genitalia, oblique and ventral aspects. 35. Egg diameter 0.60 mm.

The 8th sternite has a nose-like ventral process and a well rounded posterior margin; the anterior gonapophyses are large and triangular in shape, terminating posteriorly in blunt points.

Endoclita ijereja sp. nov.

Plate xxiii, fig. 1 and text fig. 33-35

Female. Antennae (wanting in the described specimen); head with eyes moderate, in lateral view not masking whole of head; head, thorax and base of abdomen pale fawn, abdomen possibly darker (much stained on type specimen); hind legs small, without specialized hairs. Forewings with Sc_1 present but without appreciable costal swelling, im vein separated from fork of M_1 and M_2 by a stalk shorter than in

the type of the genus; wing colour smoky-brown with numerous paler smoky-fawn markings, including a broad band across forewing from costa at four-fifths to inner margin at three-quarters; a line of black-centred pale-fawn-margined spots along costal vein, others on costal margin and a larger brownish-black spot where Cu_2 becomes obsolescent; a cluster of three white spots at junction of r-m vein and M_1, and another two (or three) at fork of M_2 and M_3, other flecks of creamy-white scattered on outer third of wing. Hindwings with veins Pcu and 1V both present; apical fifth of costa marked as in forewing, rest of wing smoky-brown; in certain lights all but the anal margin and the apical fifth of wing glows with a purplish-brown sheen. Forewing length 54 mm., expanse 114 mm.

Loc. Borneo: Mt. Kina Balu, 1,200-1,500 metres, 1893 (Waterstradt) type, a female, unique, in Mus. f. Naturk., Berlin.

This example bears a Staudinger collection No. K. 739. At first glance it is like *E. signifer* in the pattern of wing markings but the wing tip is slightly more falcate, the costal markings are more numerous and there are many points of difference in the details of the markings.

The female genitalia (fig. 33-34) have the 8th sternite with its posterior margin spade-shaped and the 7th with posterior margin straight, the anterior gonapophysial elements, in view from below, show a rounded spine-like process overlying a blunter projection; in oblique lateral view it appears more like a plate with two rounded projections; the posterior gonapophyses are large with a median keel and deep medio-lateral fold. In the form of the genitalia this species bears no relationship to *E. signifer*.

Eggs dissected from the abdomen are available as are also others still adhering to the apex of abdomen. They are 0.6 mm. in diameter, spherical, smooth, with a small circular area of different texture around the micropyle. Colour of dried eggs, dark brown (fig. 35).

Endoclita sibelae (Roepke)

Phassus sibelae Roepke 1935, Trop. Natuur. 24, p. 102, fig.

This species, described from Batjan Island, has not been examined.

Endoclita signifer (Walker)

Phassus signifer Walker 1856, Cat. Lep. Het. Brit. Mus., vii, p. 1568.

Endoclita signifer Tindale 1941, Rec. S. Austr. Mus., 7, p. 30.

Hypophassus signifer Viette 1948, Musee Heude, xii (8), p. 83.

Viette reports this species from Tonkin at Hoa Binh. It is not clear whether he has critically examined and compared the genitalia of his specimens. Previous identifications of the species in Eastern Asia all have proved to be based on other species, for example the female example described in this paper as *E. topeza* long stood under this name in the Cornell University Collection.

UNIDENTIFIED SPECIES OF ENDOCLITA

Other species thought to belong to *Endoclita* but not critically considered for this revision are *Phassus dirschi* Bang Haas 1939 from Kansu, and *Gorgopis niphonica* Butler 1879.

REFERENCES CITED

Bang-Haas, O. 1939: Iris. p. 59, fig.

Butler, A. G. 1879: Ann. Mag. Nat. Hist., (5), iv, p. 357.

Zenner, F. E. 1943: Trans. Zool. Soc. London, 25, p. 110.

ADDITION TO PREVIOUS PART

Sahyadrassus magnus Tindale

Plate xxiii, fig. 2

In a previous part of this revision, Tindale (1942, p. 154), this species was described, but not figured. The paper had been rather rapidly completed during a brief leave from military duties. The deficiency is now made good. The only known example, in the British Museum, is a rather dilapidated looking male which was much injured in the post when being sent to me in Australia. In the original description it was ascribed in error to the South Australian Museum collection.